

Geometry · Coordinate Geometry Proofs · Worksheet

Common Core G-GPE.B.4, G-GPE.B.5, G-GPE.B.6, G-GPE.B.7 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These 25 problems practice coordinate geometry for Geometry students, aligned to G-GPE.B.4, G-GPE.B.5, G-GPE.B.6 and G-GPE.B.7. They begin with the distance and midpoint formulas and move through slopes and equations of parallel and perpendicular lines.

Later problems partition segments in a ratio, find perimeter and area, and prove that triangles and quadrilaterals have a given type. The last six are word problems and multi-step tasks.

Geometry Common Core: G-GPE.B.4 · G-GPE.B.5 · G-GPE.B.6 · G-GPE.B.7

Problem 1: Vertical distance

Find the length of the segment with endpoints $(-3, 4)$ and $(-3, -6)$.

Problem 2: Distance with a 3-4-5 triangle

Use the distance formula to find the distance between $(1, 2)$ and $(4, 6)$.

Problem 3: Distance between two points

Find the distance between $(-2, -1)$ and $(4, 7)$.

Problem 4: Distance as a radical

Find the exact distance between $(-3, 2)$ and $(1, 4)$, then round to the nearest hundredth.

Problem 5: Midpoint of a segment

Find the midpoint of the segment with endpoints $(2, 8)$ and $(10, -4)$.

Problem 6: Midpoint with fractions

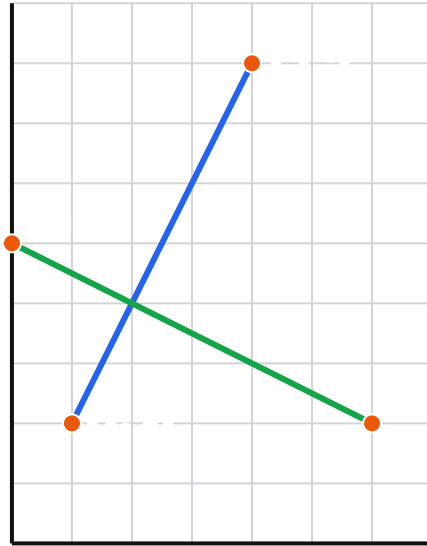
Find the midpoint of the segment with endpoints $(-5, 3)$ and $(2, 6)$.

Problem 7: Missing endpoint

The midpoint of $\overline{AB}$ is $M(3,-1)$ and the endpoint A is $(-2,4)$. Find the coordinates of B .

Problem 8: Slopes of two lines

Line a passes through $(1,2)$ and $(4,8)$. Line b passes through $(0,5)$ and $(6,2)$. Decide whether the lines are parallel, perpendicular, or neither.



Lines a and b on the coordinate plane.

Problem 9: Parallel line through a point

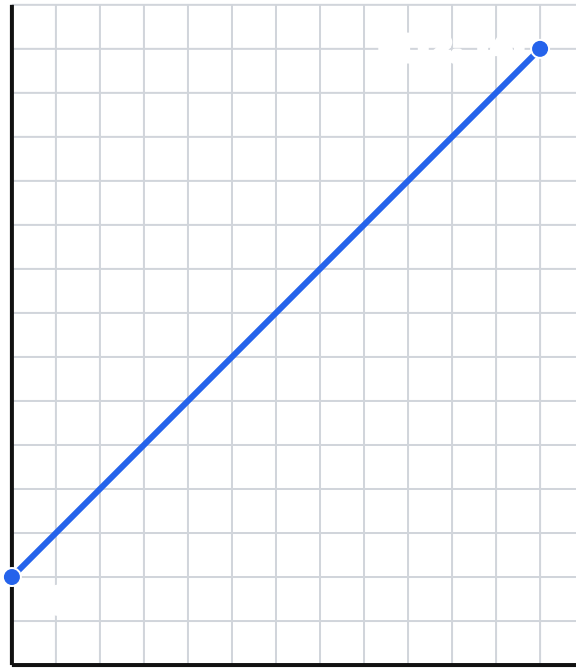
Write an equation of the line through $(4,-1)$ that is parallel to $y = 3x - 2$.

Problem 10: Perpendicular line through a point

Write an equation of the line through $(6,2)$ that is perpendicular to $y = -\frac{2}{3}x + 1$.

Problem 11: Point one third of the way

Find the point P on $\overline{AB}$ that partitions the segment from $A(0,2)$ to $B(12,14)$ in the ratio 1:2.



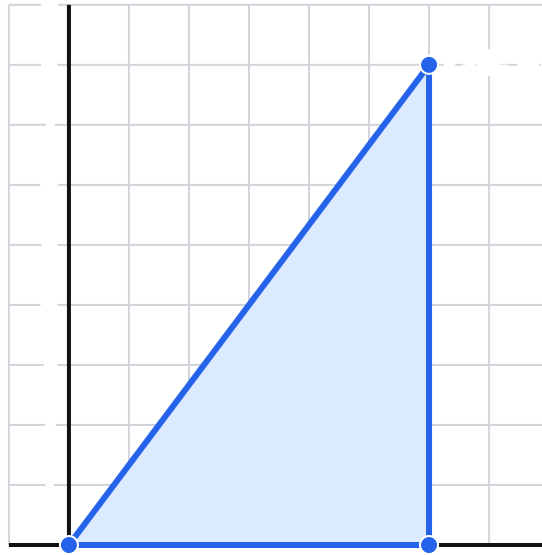
Segment AB on the coordinate plane.

Problem 12: Ratio 3 to 2

Find the point that partitions the segment from $A(-6,2)$ to $B(4,-8)$ in the ratio 3:2 measured from A .

Problem 13: Perimeter of a triangle

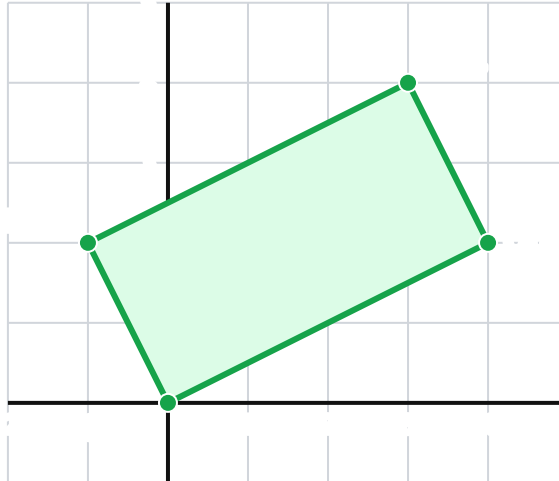
Triangle ABC has vertices $A(0,0)$, $B(6,0)$ and $C(6,8)$. Find its perimeter.



Triangle ABC on the coordinate plane.

Problem 14: Area of a tilted rectangle

Rectangle $PQRS$ has vertices $P(0,0)$, $Q(4,2)$, $R(3,4)$ and $S(-1,2)$. Find its area.



Rectangle PQRS on the coordinate plane.

Problem 15: Area of a triangle

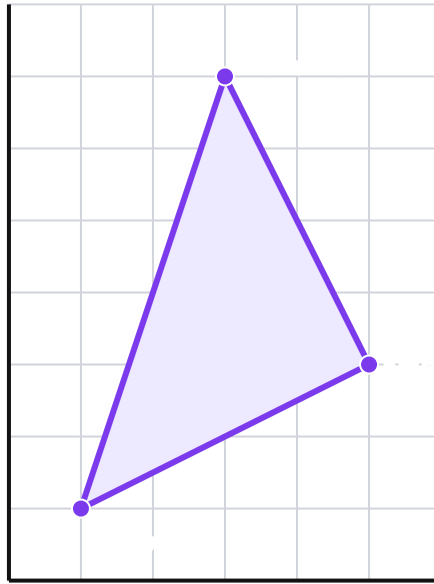
Find the area of the triangle with vertices $A(-2,1)$, $B(6,1)$ and $C(1,7)$.

Problem 16: Classify a triangle by sides

Triangle ABC has vertices $A(1,1)$, $B(7,1)$ and $C(4,6)$. Use the distance formula to decide whether it is scalene, isosceles, or equilateral.

Problem 17: Right angle with slopes

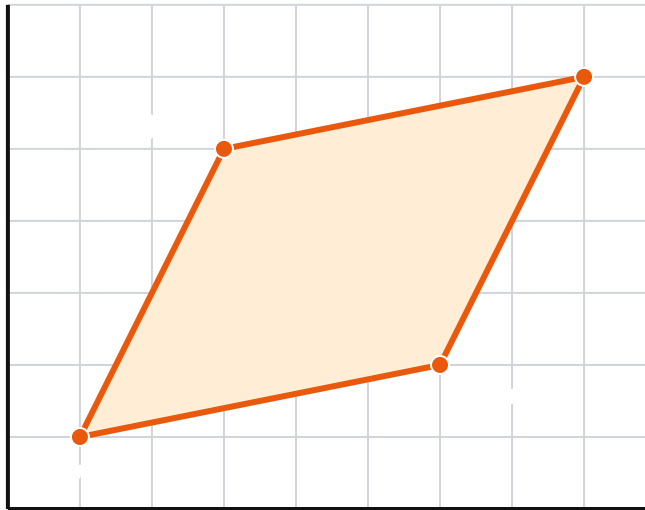
Triangle PQR has vertices $P(1,1)$, $Q(5,3)$ and $R(3,7)$. Show that it is a right triangle and find its area.



Triangle PQR on the coordinate plane.

Problem 18: Prove a parallelogram

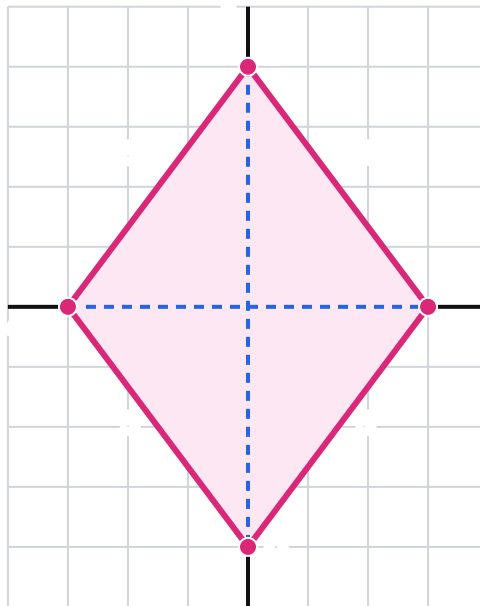
Quadrilateral $ABCD$ has vertices $A(1,1)$, $B(6,2)$, $C(8,6)$ and $D(3,5)$. Prove that it is a parallelogram by finding the midpoints of its diagonals.



Quadrilateral ABCD on the coordinate plane.

Problem 19: Prove a rhombus

Prove that the quadrilateral with vertices $A(-3,0)$, $B(0,4)$, $C(3,0)$ and $D(0,-4)$ is a rhombus, then find its area.



All four sides of ABCD measure 5 and the diagonals are perpendicular.

Problem 20: Walk to the library

On a map of Maya's town, each unit is one block and each block is 0.1 mile. The school is at

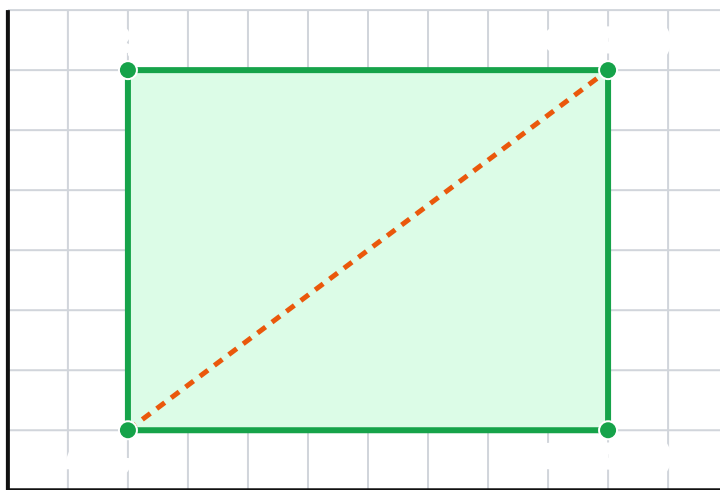
$S(2,3)$ and the library is at $L(14,8)$. (a) Find the straight-line distance from the school to the library in miles. (b) A bench sits halfway between them. Find its coordinates.

Problem 21: Ranger station on a trail

A straight trail runs from the trailhead $T(0,0)$ to a campsite $C(15,20)$ on a map where each unit is 0.1 mile. The ranger station R is on the trail, $\frac{2}{5}$ of the way from the trailhead to the campsite. Find the coordinates of R and the distance from R to the campsite in miles.

Problem 22: Garden fence cost

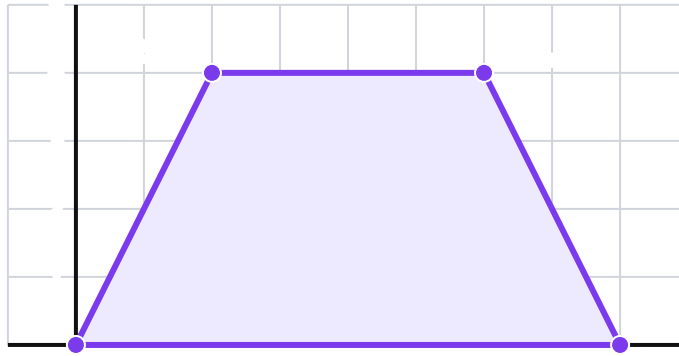
Diego plans a rectangular garden with corners $A(2,1)$, $B(10,1)$, $C(10,7)$ and $D(2,7)$ on a plan where each unit is 1 foot. (a) Find the perimeter. (b) Fencing costs \$4.50 per foot; find the total cost. (c) Find the area. (d) A path runs from A to C ; find its length.



Garden plan with a diagonal path from A to C (each unit is 1 foot).

Problem 23: Isosceles trapezoid park

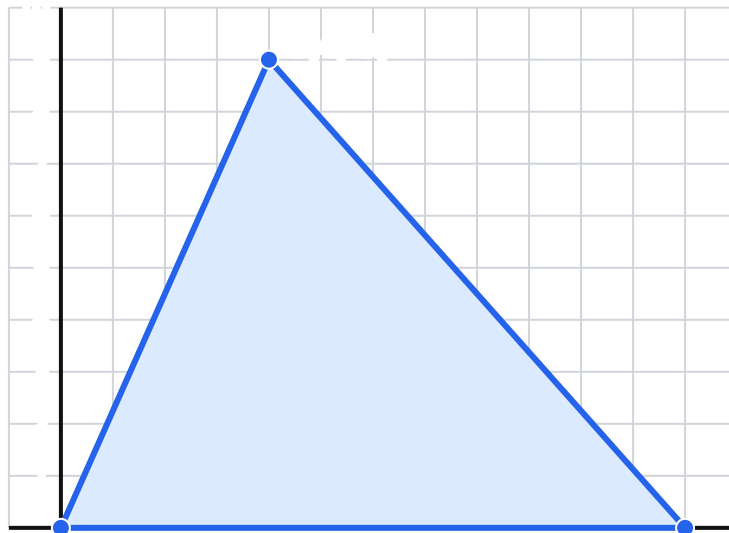
A park has corners $A(0,0)$, $B(8,0)$, $C(6,4)$ and $D(2,4)$ on a map where each unit is 10 yards. Prove that $ABCD$ is an isosceles trapezoid, then find its area in square yards.



Park plan on a map grid.

Problem 24: Split a triangle

Triangle ABC has vertices $A(0,0)$, $B(12,0)$ and $C(4,9)$. Point D partitions $\overline{AB}$ in the ratio 1:2 from A . (a) Find D . (b) Show that $\overline{CD}$ is perpendicular to $\overline{AB}$. (c) Find the area of triangle ABC . (d) Find the perimeter of triangle ACD to the nearest hundredth.



Triangle ABC on the coordinate plane.

Problem 25: Drone flight

Jamal's drone takes off from $P(-4,-2)$ and flies in a straight line to a landing spot $L(8,14)$ on a map where each unit is 10 yards. (a) How many yards does it fly? (b) It pauses to take a photo at the midpoint of the flight. Find the coordinates of that point.